

Remarks

This amendment is submitted in response to the Office action mailed October 3, 2006.

The abstract is amended herein to provide the abstract on separate sheet without drawings in response to the objection to the specification. No substantive amendments are made to the abstract.

The claims have been amended to remove improper multiple dependencies.

The omnibus claims (claims 19-21) are cancelled herein.

Patentability of Claimed Invention

Claims 1-18 will be pending after entry of this amendment. Claims 1-18 are submitted to be patentable for the reasons set forth below.

Patentability of Claims 1-17.

A problem with prior art fuel injection systems is that it is difficult to obtain solenoids or other control means that are large enough to control a sufficient volume of gas while operating at a high enough speed when larger gas flows are required. In prior art fuel injection systems, the larger the gas flow, the larger and slower the solenoid valve or other control means needs to be. Specification ¶ 0004. The present invention provides control for a relatively large gas flow without using a corresponding large and relatively slow control apparatus. Specification ¶ 0041.

Independent Claim 1 is directed to an apparatus comprising:

"(i) A first chamber including an inlet connectable with a source of gaseous fuel at a required inlet pressure;

(ii) A second chamber connectable with an engine or other apparatus so as to supply gaseous fuel thereto and further connected with said first chamber through a controllable valving means;

(iii) **A flow control means having an inlet connectable with said first chamber and an outlet connectable with an orifice means for controlling the pressure at the outlet of said flow control means to be no more than 53% of the inlet pressure;**

(iv) Detection means for detecting said outlet pressure and controlling said valving means;

(v) **The arrangement being such that controlling the said flow control means to adjust the flow of gaseous fuel therethrough controls the said outlet pressure which in turn controls said controllable valving means and the pressure in said second chamber, so as to thereby control the flow of gaseous fuel to said engine or other apparatus.**" (Emphasis added).

Similarly, independent claim 12 is directed to a method comprising providing the flow control recited at item (iii) of claim 1 and using the flow control to control gaseous fuel flow to the engine or other apparatus. Claims 1 and 12 are patentable in that the prior art of record fails to disclose or suggest a flow control means having an inlet connectable with the first chamber of a flow control apparatus and an outlet connectable with an orifice means. The prior art also fails to disclose or suggest such a flow control means being such that controlling the flow control means adjusts the flow of gaseous fuel therethrough and thereby controls the outlet pressure, which in turn controls the controllable valving means as set forth in claims 1 and 12.

U.S. Patent No. 4,829,957 (Garretson et al.) discloses a fuel injection system for internal combustion engines that uses a particular "variable-pressure-controller" (30). The variable-pressure-controller (30) is connected to a source of gaseous fuel in the form of a tank (T) via a solenoid shuttle

valve (V1). Gaseous fuel is fed into a primary chamber (76) and the flow of gaseous fuel into the primary chamber (76) is regulated by a needle valve (72). An orifice (51) permits fuel from the primary chamber (76) to flow into a second chamber (D) and the flow of gaseous fuel through the orifice (51) is regulated by a fuel valve (52), which is activated to open and close the orifice (51) by movement of two diaphragms (42, 36). A fuel line (L4a) is connected to a fuel outlet (47) in the chamber (D). The fuel line (L4a) feeds two other fuel lines (L4b) through a flow restrictor (100). The fuel lines (L4b) lead to a carburetor (10) and are each terminated by nozzles (92) that spray fuel from the fuel lines (L4b) into the air intake of the carburetor (10). A port (91) is provided at the air intake of the carburetor (10) and this is connected to a port (46) in a third chamber (C) via a line (L3).

Firstly, it should be noted that the fuel line (L4a) is connected to the second chamber (D) via the fuel port (47), not the primary chamber (76). Therefore, the two other fuel lines (L4b) and the nozzles (92), are connected to the chamber (D) via the port (47) and the fuel line (L4a) (see column 6, lines 47-51). It is important to note that in Garretson et al. the fuel lines (L4b) and the nozzles (92) are not connected to the primary chamber (76), contrary to the assertion in the Office action.

Secondly, the nozzles (92) in Garretson et al. are not "flow control means" (contrary to what is set forth in the Office action) as there is no mechanism by which they can be controlled. In fact, the nozzles (92) are really orifices that permit the fuel from the fuel lines (L4b) to be fed into the air intake of the carburetor (10) in a desired spray pattern.

There is no disclosure in Garretson et al of a flow control means that has inlet connectable with a first chamber (the primary chamber (76) in Garretson et al.). Furthermore there is no disclosure in Garretson et al. of a flow control means that can be controlled to adjust the flow of gaseous fuel therethrough to control a controllable valving means (the fuel valve (52) in Garretson et al.).

Furthermore, there is no disclosure or suggestion in Garretson et al. or the other prior art of record as to how the arrangement disclosed in Garretson et al, could be modified to arrive at the invention as claimed in the independent claims 1, 12 and 18. Accordingly, claims 1 and 12 are not anticipated or rendered obvious by the prior art of record, including Garretson et al.

Claims 2-11 and 13-17 depend directly or indirectly from either claim 1 or claim 12 and are patentable for at least the same reasons.

Claim 18.

Claim 18 is directed to a feedback controlled regulator stage including a feedback chamber in which pressure in the feedback chamber is controlled by a feedback regulator. Claim 18 is patentable in that the prior art of record fails to disclose or suggest a feedback controlled regulator stage having a feedback chamber in which pressure is controlled by a feedback regulator.

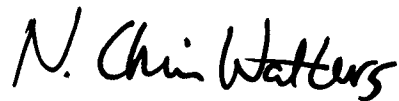
There is no disclosure in Garretson et al. of a feedback controlled regulator stage having a feedback chamber in which pressure in the feedback chamber is controlled by a feedback regulator.

Accordingly, claim 18 is also not anticipated by the disclosure in Garretson et al. Furthermore, there is no disclosure or suggestion in Garretson et a. as to how the apparatus disclosed in Garretson et al., could be modified to arrive at the feedback controlled regulator stage set forth in claim 18. Thus, claim 18 is submitted to be patentable over the prior art of record.

Applicant respectfully requests issuance of a Notice of Allowance for the reasons set forth above.

The Commissioner is hereby authorized to charge \$510 for a three month extension of time and any other fees that are required in connection with this application to Deposit Account Number 19-1345 in the name of Senniger Powers.

Respectfully submitted,

A handwritten signature in black ink that reads "N. Chris Walters". The signature is written in a cursive, slightly slanted style.

N. Chris Walters, Reg. No. 52,338
SENNIGER POWERS
One Metropolitan Square, 16th Floor
St. Louis, Missouri 63102
(314) 231-5400

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